

- JOB NO. 4561 DIXIE CARRIERS -  
BARGE: MRC-3 2/95

HER 05310

  
UPC





**DOOLEY TACKABERRY**

Fire &amp; Safety - Equipment/Services/Systems

1744 WEST 4TH ST., STE. 205  
FREEPORT, TX 77541**INVOICE**

Please Remit To:

DOOLEY TACKABERRY, INC.

P.O. BOX 299644

HOUSTON, TEXAS 77299-0644

INVOICE #: 257773

DATE: 02/24/95

PAGE: 1 OF 1

54928  
HERCULES OFFSHORE  
P.O. DRAWER Q  
FREEPORT, TX 77541Ship To:  
HERCULES OFFSHORE  
906 MARLIN  
FREEPORT, TX 77541

CUST.P/O#: 90040		RELEASE #:		JOB #:		
PAYMENT TERMS: NET 30 DAYS		SHIP VIA: UPS GROUND		FREIGHT TERMS: PREPAID		
ORDER-DATE: 02/23/95		ORDER #257330		W/B:KL8 SLSM #: 102 F.O.B.		
PRODUCT / DESCRIPTION	QUANTITY OPEN	QUANTITY SHIPPED	QUANTITY B/O	UNIT PRICE	U/M	EXTENSION
51026 RS34, CATERPILLAR, TV/AG (10/BOX)	3	3	0	34.00	BOX	102.00
THANK YOU FOR YOUR BUSINESS						
MERCHANDISE TOTAL	MISC CHGS	SALES TAX	FREIGHT	PLEASE PAY THIS AMOUNT		INVOICE TOTAL
102.00	0.00	0.00	0.00			102.00

No credit will be allowed for material returned without our authorization. All claims for loss or damage should be made to the transportation company at once. Seller represents that the articles or services covered by this invoice were produced in compliance with the Fair Labor Standards Act of 1938, as amended.

ALL INVOICES DUE AND PAYABLE IN HOUSTON, HARRIS COUNTY, TEXAS

HER 05312

Job #: 4561	Invoice #:
Date Started: February 22, 1995	Date Finished: February 22, 1995
Job Type: CLEANING	
Customer: DIXIE CARRIERS	Barge Name/#: MRC-3
-----	
Estimated Materials :	TOTAL Materials : 19.18
Estimated Labor :	TOTAL Labor : 1,058.13
Estimated Waste Water:	TOTAL Waste Water: 420.00
Total Estimated Cost : 0.00	TOTAL JOB COST : 1,497.31
	AMOUNT BILLED : 3,451.51
	PROFIT/(LOSS) : 1,954.20

# of Gallons: 1,200	x \$ 0.35	per gallon =	\$: 420.00
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[illegible]

Invoice #	Vendor	P.O. #	Amount
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:	:	:	:
:	:	:	: HER 05313
:	:	:	:
:	:	:	:

TOTAL MATERIALS : 19.18

LABOR HOURS

[illegible]

LABOR HOURS con't

[illegible]

**HER 05314**

HERCULES  
MARINE SERVICE CORP.  
FREEPORT, TEXAS  
**FOREMAN'S DAILY TIME REPORT**

[illegible]

CLASS NO. mpc-3

THE  
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NAME \_\_\_\_\_

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**HER 05315**

211

**SIGNED**

James C. Crehan  
FOREMAN

CODED  
AND  
EXTENDED  
BY

APPROVED  
BY

## DESCRIPTION OF WORK PERFORMED (BY FOREMAN)

JOB NO 4561  
DATE 2/28/95  
CLASS NO DFC-2

TOTAL HOURS

could water wash  
it away

[illegible]

**HER 05316**

31 1/2	2 1/6
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SIGNED Henry C. Cohen  
FOREMAN

CODED  
AND  
EXTENDED  
BY

APPROVED  
BY

# HERCULES

MARINE SERVICES CORPORATION

P. O. Drawer O • Freeport, Texas 77541

INVOICE NO. : 2835-95

DATE : Mar 4, 1995

Job No. : 4261-1

Location : Freeport Yard

TO: Dixie Carriers, Inc.  
2102 Broadway  
Houston, Texas 77012

PLEASE REMIT PAYMENTS TO:  
11011 RICHMOND  
SUITE 500  
HOUSTON, TX. 77042

Terms : Net 30

FOR: Services to the barge MRC-3 as follows:

Set up equipment  
Strip out all free product  
Cold water wash pipeline and stripping system  
Cold water wash cargo tanks  
Blow cargo pipeline and stripping system  
Vacuum blow dry cargo tanks  
Sweep powder rust from cargo tank floor  
Wash and strip deck around engine and headers  
Pressure test cargo pipeline to 40# psi  
Clean off deck  
Remove equipment  
Close barge

LABOR: Foreman	1½ @	36.00	\$	54.00
Leadman	4 @	33.50		134.00
	5½ @	48.00		264.00
Journey	16 @	31.00		496.00
	26 @	44.25		1,150.50
Disposal: 1200 gal	@	.35		420.00
Material: 19.18 +		3.83		23.01
Equip:				
Compressor	10 @	44.00		440.00
Air Movers	30 @	5.00		150.00
Tugboat	1 @	80.00		80.00
Vacuum	3 @	18.00		54.00
Hand Hose	3 @	10.00		30.00
2" strip pump	8 @	12.00		96.00
Butterworth	6 @	10.00		60.00

TOTAL AMOUNT DUE:

\$3,451.51

Arrived: 2/22 time 7:30pm to 1:00am  
Completed: 2/23 time 7:00am to 11:00am  
Product: Cumene  
Load: Styrene

PHONE: (409) 233-6371

HER 05317





HERCULES  
MARINE SERVICES CORPORATION

Strength through environmental awareness and customer service

P.O. Drawer 0  
Freeport, Texas 77541

Office (409) 233-6371  
Fax (409) 233-6375

EQUIPMENT	HOURS USED	HOURLY RATE	TOTAL PRICE
2- COMPRESSOR	5 HRS EA 10 HRS	44.00	
6- AIR MOVERS	30 HRS	5.00	
VACUUM	3 HRS	20.00	
BOLLER		20.00	
HAND HOSE	3 HRS	10.00	
1- BUTTERWORTH	3 HRS EA 6 HRS	10.00	
2- 2" STRIP PUMP	4 HRS EA 8 HRS	12.00	
3" DIESEL PUMP		14.00	
4" ELECT PUMP		15.00	
CRANE		130.00	
CHERRY PICKER		50.00	
FORKLIFT	1 HR	20.00	
TUG BOAT		20.00	
WELD MACHINE		15.00	
CUTTING RIG		2.00	
WORK BARCE		35.00	
HAUL COT		1100.00	

DATE: 2-22-95 JOB NO: 4561 TARGE NAME: MRC-3

DISPOSAL WATER 1200 GALS

HER 05318

MRC-3 barge  
O/T lunches

WOODBRIDGE

THANK YOU

REG 3 ORDER 18 STORE 7172  
2/22/95 2110

HIGH ORDER RECEIPT

RECEIPT # 2

QUAN	V/HOME	10.50
	95 BM	2.85
	M-COKE	4.45
	SUB TOTAL	17.80
	TAX TOTAL	1.35
	TAKE OUT TOTAL	19.15
	CASH TEND	20.00
	CHANGE	.85

HER 05319

T I M E S H E E T

DATE: 2-23-85

BARGE NAME: MXC-3

OVERHEAD: \_\_\_\_\_

BOAT NAME: \_\_\_\_\_

OFFSHORE: \_\_\_\_\_

TIME START: 2:00 AM

TIME STOP: 11:00 AM

NAME: <u>2</u>	HOURS:
DANIEL HERNANDEZ ✓	4
JOE OLIVAREZ ✓	4
TRINO RODRIGUEZ	
SAM PETTIT	
JIMMY JACKSON	
GABRIEL DE LA ROSA ✓	1 1/2
RICHARD RODRIGUEZ	
DOMINGO CUEL ✓	4
JUAN RIVERA ✓	4
CLAUDIO DUARTE ✓	4
LARRY BALLINGER	

JOB DESCRIPTION: Blow Dry; Blow Pipe Pipe

HER 05320

JOB NO: 4561

BARGE NAME: MRC-3

DATE: 2-22-95

WORK SCOPE

SETUP EQUIPMENT ✓

STRIP OUT ALL FREE PRODUCT ✓

HOT WATER WASH AND BLOW PIPELINE AND STRIPPING SYSTEM                     

HOT WATER WASH CARGO TANKS                     

COLD WATER WASH PIPE LINE AND STRIPPING SYSTEM ✓

COLD WATER WASH CARGO TANKS ✓

HOT CHEMICAL WASH                     

BLOW CARGO PIPELINE AND STRIPPING SYSTEM ✓

VACUUM BLOW DRY CARGO TANKS ✓

SWEEP POWDER RUST FROM CARGO TANK FLOORS ✓

WASH AND STRIP DECK AROUND ENGINE AND HEADERS ✓

PRESSURE TEST CARGO PIPELINE TO 40# PSI ✓

CLEAN OFF DECK ✓

REMOVE EQUIPMENT ✓

CLOSE BARGE ✓

HER 05321

T I M E S H E E T

DATE: 2-22-95

BARGE NAME: MTC-3

OVERHEAD: \_\_\_\_\_

BOAT NAME: \_\_\_\_\_

OFFSHORE: \_\_\_\_\_

TIME START: 7:30 PM.

TIME STOP: 1:00 AM.

NAME: <u>✓</u>	HOURS:
DANIEL HERNANDEZ <u>✓</u>	<u>5½</u>
JOE OLIVAREZ <u>✓</u>	<u>5½</u>
TRINO RODRIGUEZ	
SAM PETTIT	
JIMMY JACKSON	
GABRIEL DE LA ROSA	
RICHARD RODRIGUEZ	
DOMINCO CUEL <u>✓</u>	<u>5½</u>
JUAN RIVERA <u>✓</u>	<u>5½</u>
CLAUDIO DUARTE <u>✓</u>	<u>5½</u>
LARRY BALLINGER	

JOB DESCRIPTION: COLD WATER WASH BLOW DRY

HER 05322

# JOB WORKSCOPE/BREAKDOWN

JOB NO: 4561 CUSTOMER: Dixie BARGE: mrc-3

FOREMAN:	S/T	<u>1 1/2</u>	@36.00		\$ <u>54.00</u>
	O/T		@51.75		
LEADMAN:	S/T	<u>4</u>	@33.50		<u>134.00</u>
	O/T	<u>5 1/2</u>	@48.00		<u>264.00</u>
JOURNEY:	S/T	<u>16</u>	@31.00		<u>496.00</u>
	O/T	<u>26</u>	@44.25		<u>1,150.50</u>
235					
DISPOSAL:		<u>1200</u>	GAL @ .35		<u>420.00</u>
MATERIAL:		<u>19.18</u>	PLUS 20%	<u>3.83</u>	<u>23.01</u>
STOCK MATERIAL:			PLUS 20%		

## EQUIP:

COMPRESSOR	<u>10</u>	@ 44.00	<u>440.00</u>
AIR MOVERS	<u>30</u>	@ 5.00	<u>150.00</u>
FORKLIFT		@ 20.00	
TUGBOAT	<u>1</u>	@ 80.00	<u>80.00</u>
STEAM RIG		@ 80.00	
VACUUM	<u>3</u>	@ 18.00	<u>54.00</u>
HAND HOSE	<u>3</u>	@ 10.00	<u>30.00</u>
WELDING MACHINE		@ 15.00	
CHERRY PICKER		@ 50.00	
CRANE		@130.00	
FLATBED TRUCK		@ 20.00	
3" GAS PUMP		@ 14.00	
2" STRIP PUMP	<u>8</u>	@ 12.00	<u>96.00</u>
BUTTERWORTH	<u>6</u>	@ 10.00	<u>60.00</u>
4" ELECTRIC PUMP		@ 15.00	
WORK BARGE		@ 35.00	
CUTTING RIG		@ 8.00	
HAUL OUT		@1100.00/day	

ARRIVED: 2/22 COMPLETED: \_\_\_\_\_ DEPARTED: \_\_\_\_\_

PRODUCT: Cumene LOAD: Styrene

TOTAL INVOICE:

3451.51

Cu

HER 05323

# HERCULES OFFSHORE CO.

## MARINE REPAIR

MARINE OPERATIONS FACILITY

INVOICE NO. \_\_\_\_\_

ORDER No. 4561

CUSTOMER P.O. \_\_\_\_\_

DATE	ORDER WRITTEN	ETA
	ARRIVAL	
	COMPLETION DATE	7:30 PM
	DEPARTURE DATE	
M/V <input type="checkbox"/> BARGE <input checked="" type="checkbox"/>		
NAME <u>M RC - 3</u>		
LOA _____ WIDTH _____		
FOREMAN		
<u>C. DUARTE</u>		
LAST PRODUCT		
<u>CUMENE TO STYRENE</u>		
GAS FREEING YES <input type="checkbox"/> NO <input type="checkbox"/> CERTIFICATE REQUIRED YES <input type="checkbox"/> NO <input type="checkbox"/>		
HAUL OUT FOR INSPECTION AND REPAIR YES <input type="checkbox"/> NO <input type="checkbox"/>		
ON WAYS _____ DATE: _____		
ON WAYS _____ DATE: _____		

CUSTOMER	NAME	<u>DIXIE CARRIER</u>
	BILLING ADDRESS	
	CITY AND STATE	
	PHONE NUMBER	
WORK AUTHORIZED BY		BY AUTHORIZED BY
<u>M. GREEN</u>		<u>M. GREEN</u>
STOCK MATERIAL <input type="checkbox"/> YES <input type="checkbox"/> NO		
IF YES, COMPLETE STOCK MATERIAL TRANSFER TICKET		
OUTSIDE SERVICES <input type="checkbox"/> YES <input type="checkbox"/> NO		
IF YES, LIST		

### ITEM NUMBERS

- 1 COLD WATER WASH AND BLOW DRY
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_
- 6 \_\_\_\_\_
- 7 \_\_\_\_\_
- 8 \_\_\_\_\_
- 9 \_\_\_\_\_
- 10 \_\_\_\_\_

THIS SHALL SERVE AS YOUR AUTHORIZATION TO PROCEED WITH THE ABOVE.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

HER 05324

# HERCULES OFFSHORE CO.

INVOICE NO. \_\_\_\_\_

## MARINE REPAIR

MARINE OPERATIONS FACILITY

CUSTOMER P.O. \_\_\_\_\_

ORDER No. 4561

DATE	ORDER WRITTEN	ETA
	2-22-95	
	ARRIVAL	
	2-22-95 7:30 PM	
	COMPLETION DATE	
	DEPARTURE DATE	
	M/V <input type="checkbox"/> BARGE <input checked="" type="checkbox"/>	
	NAME <u>MRC-3</u>	
	LOA	WIDTH
	FOREMAN	
	<u>C. DUARTE</u>	
	LAST PRODUCT	
	<u>CUMENE TO STYRENE</u>	
	GAS FREEING YES <input type="checkbox"/> NO <input type="checkbox"/>	CERTIFICATE REQUIRED YES <input type="checkbox"/> NO <input type="checkbox"/>
	HAUL OUT FOR INSPECTION AND REPAIR YES <input type="checkbox"/> NO <input type="checkbox"/>	
	ON WAYS	DATE: _____
	ON WAYS	DATE: _____

CUSTOMER	NAME	
	<u>DIXIE CARRIER</u>	
	BILLING ADDRESS	
	CITY AND STATE	
	PHONE NUMBER	
	WORK AUTHORIZED BY	OFF AUTHORIZED BY
	<u>M. GREEN</u>	<u>M. GREEN</u>
	STOCK MATERIAL	<input type="checkbox"/> YES <input type="checkbox"/> NO
	IF YES, COMPLETE STOCK MATERIAL TRANSFER TICKET	
	OUTSIDE SERVICES	<input type="checkbox"/> YES <input type="checkbox"/> NO
	IF YES, LIST	

### ITEM NUMBERS

1	<u>COLD WATER WASH AND BLOW DRY</u>
2	
3	
4	
5	
6	
7	
8	
9	
10	

THIS SHALL SERVE AS YOUR AUTHORIZATION TO PROCEED WITH THE ABOVE.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_ HER 05325 \_\_\_\_\_





Strength through experience, equipment know-how  
P.O. Drawer O Office: (409) 233-6371  
Freeport, Texas 77541 Fax: (409) 233-6375

### FINAL CHECK LIST

DATE: 2-23-95

BARGE: MRC-3

BLND NUMBER CHECKED 2 REPLACED GASKET YES    NO ✓

GATE VALVE NUMBER CHECKED 4 REPLACED GASKET YES    NO ✓

PLUGS NUMBER CHECKED 3 REPLACED PLUG YES    NO ✓

\* CHECK VALVE NUMBER CHECKED 1 REPLACED GASKET YES ✓ NO   

DEEPWELL BLIND NUMBER CHECKED N/A REPLACED GASKET YES    NO   

BELOW DECK CARGO PIPELINE BLIND NUMBER N/A REPLACED GASKET YES    NO   

BELOW DECK CARGO PIPELINE BLIND REMOVED YES N/A NO   

DRIP PANS VALVES: CLOSED BY MIN90

DRIP PANS COVER: CLOSED BY MIN90

CONTAINMENT AREA PLUG OR VALVES: CLOSED BY N/A

AIR TEST CARGO LINE - 40psi - USING SOAP

SIGNATURE OF TESTER: [Signature]

WITNESS: [Signature]

- \* CHECK VALVE GASKET WILL BE REPLACED
- \* AIR TEST IS LAST THING TO BE DONE BEFORE RELEASING BARGE.

HER 05326

## BARGE CLEANING REPORT

JOB NO. H561  
 BARGE NO. MAX C-3  
 CUSTOMER DIXIE CARRIER  
 PRODUCT CUMENOL

ETA \_\_\_\_\_  
 DATE/TIME ARRIVAL 2-22-95 7:30pm  
 DATE/TIME STARTED 2-22-95  
 DATE/TIME COMPLETED \_\_\_\_\_

AMOUNT STRIPPED 500

CLEANING INSTRUCTION : \_\_\_\_\_

COMPLETION SCHEDULE BY: \_\_\_\_\_

OVERTIME AUTHORIZED BY: \_\_\_\_\_

BARGE INSPECTED BY: Charles Duarte DATE/TIME: \_\_\_\_\_

BARGE RELEASED TO: \_\_\_\_\_ DATE/TIME: \_\_\_\_\_

DEEPWELL OPENED: YES N/A NO \_\_\_\_\_ CLOSED BY \_\_\_\_\_ NEW GASKET YES \_\_\_\_\_ NO \_\_\_\_\_

BELOW DECK CARGO PIPELINE: BLIND OPEN YES ✓ NO \_\_\_\_\_ CLOSED BY MINGO NEW GASKET YES \_\_\_\_\_ NO ✓

DECK CHECK VALVE OPENED: YES ✓ NO \_\_\_\_\_ CLOSED BY MINGO NEW GASKET YES \_\_\_\_\_ NO ✓

DECK HEADER BLINDS OPEN: YES ✓ NO \_\_\_\_\_ CLOSED BY Daniel NEW GASKET YES \_\_\_\_\_ NO \_\_\_\_\_

DECK HEADER DRAIN PLUG OPEN: YES ✓ NO \_\_\_\_\_ CLOSED BY MINGO YES \_\_\_\_\_ NO \_\_\_\_\_

VAPOR RECOVERY HEADER OPENED: YES N/A NO \_\_\_\_\_ CLOSED BY \_\_\_\_\_ NEW GASKET YES \_\_\_\_\_ NO \_\_\_\_\_

RUST SCALE: YES \_\_\_\_\_ NO ✓ WASHED OUT \_\_\_\_\_ BUCKETED OUT \_\_\_\_\_

NUMBER OF CARGO TANKS 3

CONDITION OF CARGO VALVES Good

SLOP TANK STRIPPED: YES N/A NO \_\_\_\_\_

DRIIP PANS STRIPPED: YES ✓ NO \_\_\_\_\_

WEATHER: TEMP 75 RAIN \_\_\_\_\_ FOG \_\_\_\_\_ HUMIDITY \_\_\_\_\_ OVERCAST \_\_\_\_\_ CLOUDY \_\_\_\_\_ CLEAR ✓

PIPELINE WASHED: Yes PIPELINE BLOWN Yes PIPELINE SUMPS INSPECTED Duarte

BOW RAKE CHECKED: YES ✓ NO \_\_\_\_\_ STERN RAKE: YES ✓ NO \_\_\_\_\_

VOIDS: YES ✓ NO \_\_\_\_\_ SAFETY EQUIPMENT USED: \_\_\_\_\_

\*\*\*\*\*

## W O R K S C O P E

HER 05327

## HAZARDS COMMUNICATION STANDARD

OSHA 1910.1200

## EMPLOYEE HAZARDOUS MATERIALS TRAINING PROGRAM

Date 2-22-95Plant HERCULESArea GAAS FRY DOCK  
MRC-3Supervisor CLAUDIO DUARTE

Client Safety \_\_\_\_\_

The following listed materials are considered to be hazardous to the employees working in this area:

CUMENE

The employees assigned to work in this area have been informed of the hazardous materials in this area, the hazards they present to the workers, the location of hazards listed, the protective equipment that has been provided and where it is located, and procedures to be followed in case of an accidental exposure. I have received the training listed above and will so designate by signing this form.

NAME	BADGE	NAME	BADGE
<u>Claudio Duarte</u>	<u>179</u>	_____	_____
<u>David Dornell</u>	<u>326</u>	_____	_____
<u>Domenico Lual</u>	<u>29</u>	_____	_____
<u>L. J. Rivera</u>	<u>272</u>	_____	_____
<u>Jose T. Ramos</u>	<u>160</u>	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

HER 05328

**MATERIAL SAFETY DATA SHEET**

OHS05570

CITGO CORPUS CHRISTI REFINERY  
1801 NUECES BAY BOULEVARD  
CORPUS CHRISTI, TEXAS 78407  
(512) 887-3229

EMERGENCY CONTACT  
JEFFREY SASARA  
(512) 882-8871

**SUBSTANCE IDENTIFICATION**

CAS-NUMBER 98-82-8  
RTEC-NUMBER GR8575000

SUBSTANCE: CUMENE

**TRADE NAMES/SYNONYMS:**

ISOPROPYLBENZENE: 2-PHENYLPROPANE: CUMOL: (1-METHYLETHYL)  
BENZENE: ISOPROPYL BENZENE: UO55: UN 1918: O-2005: 1481-P:  
OHS05570

**CHEMICAL FAMILY:**

HYDROCARBON, AROMATIC

MOLECULAR FORMULA: C9-H12

MOLECULAR WEIGHT: 120.19

CERCLA RATINGS (SCALE 0-3): HEALTH=2 FIRE=3 REACTIVITY=0  
PERSISTENCE=1

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=3 REACTIVITY=0

**COMPONENTS AND CONTAMINANTS**

COMPONENT: CUMENE

PERCENT: 100.0

OTHER CONTAMINANTS: NONE

**EXPOSURE LIMIT:**

CUMENE:

50 PPM (245 MG/M3) OSHA TWA (SKIN)

50 PPM (245 MG/M3) ACGIH TWA (SKIN)

5000 POUNDS CERCLA SECTION 103 REPORTABLE QUANTITY

**PHYSICAL DATA**

DESCRIPTION: COLORLESS LIQUID WITH A SHARP, PENETRATING, AROMATIC  
ODOR

BOILING POINT: 306°F (152°C)

MELTING POINT: -141°F (-96°C)

SPECIFIC GRAVITY: 0.86

EVAPORATION RATE: (BU ACETATE=1) <1.0

## **MATERIAL SAFETY DATA SHEET - CUMENE**

**SOLUBILITY IN WATER: INSOLUBLE**

**VAPOR DENSITY: 4.1**

**VAPOR PRESSURE: 8 MMHG @ 20°C**

**ODOR-THRESHOLD: 1.2 PPM**

**OTHER SOLVENTS (SOLVENT - SOLUBILITY):**

**ALCOHOL, ETHER, ACETONE, BENZENE, CARBON TETRACHLORIDE**

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### **FIRE AND EXPLOSION DATA**

#### **FIRE AND EXPLOSION HAZARD**

Dangerous fire hazard when exposed to heat or flame.

Vapor-air mixtures are explosive above flash point.

Vapors are heavier than air and may travel a considerable distance to a source of ignition and flash back.

The substance can generate electrostatic charges as a result of flow or agitation due to low electric conductivity.

**FLASH POINT: 96°F (36°C) (CC)**

**UPPER EXPLOSION LIMIT: 6.5%**

**LOWER EXPLOSION LIMIT: 0.9%**

**AUTOIGNITION TEMP.: 795°F (424°C)**

**FLAMMABILITY CLASS (OSHA): IC**

#### **FIREFIGHTING MEDIA:**

Dry Chemical, Carbon Dioxide, Halon, water spray or standard foam (1987 Emergency Response Guidebook, DOT P 5800.4).

For larger fires, use water spray, fog or standard foam (1987 Emergency Response Guidebook, DOT P 5800.4).

#### **FIREFIGHTING:**

Move container from fire area if possible. Dike fire control water for later disposal; do not scatter the material. Cool fire-exposed containers with water from side until well after fire is out. Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire (1987 Emergency Response Guidebook, DOT P 5800.4, Guide Page 28).

Extinguish only if flow can be stopped; use flooding amounts of water as a fog, solid streams may be ineffective. Cool containers with flooding amounts of water, apply from as far a distance as possible. Avoid breathing vapors, keep upwind.

Fire Fighting Phases: Use water spray, dry chemical, foam, or carbon dioxide. Use water to keep fire-exposed containers cool. Water spray may be ineffective as an extinguishing agent. Direct hose streams from a protected location. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect persons attempting to stop a leak. Water spray may be used to flush spills away from exposures (NFPA 49, Hazardous Chemicals Data, 1975).

## **MATERIAL SAFETY DATA SHEET - CUMENE**

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### **TRANSPORTATION**

Department of Transportation Hazard Classification 49CFR172.101:  
Flammable Liquid

Department of Transportation Labeling Requirements 49CFR172.101 and 172.402:  
Flammable Liquid

Department of Transportation Packaging Requirements: 49CFR173.119

Exceptions: 49CFR173.118

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### **TOXICITY**

#### **CUMENE:**

10 MG/24 hours open skin-rabbit mild irritation; 86 MG eye-rabbit mild irritation; 200 PPM inhalation-human TCLO; 1400 MG/KG oral-rat LD50; 8000 PPM/4 hours inhalation-rat LC50; 24700 MG/M3/2 hours inhalation-mouse LC50; 12300 MG/KG skin-rabbit LD50; CARCINOGEN STATUS: NONE.

Cumene is an eye, mucous membrane and skin irritant and a central nervous system depressant. Poisoning may affect the lungs, liver or kidneys. Persons with a history of renal, liver, chronic respiratory or skin disease may be at an increased risk from exposure. The use of alcoholic beverages may enhance the toxic effects.

Epidemiological studies involving petroleum refinery workers indicate persons with routine exposure to petroleum or one of its constituents may be at an increased risk to the development of benign neoplasms, digestive system cancers, and skin cancer, particularly melanoma.

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### **HEALTH EFFECTS AND FIRST AID**

#### **INHALATION:**

##### **CUMENE:**

**IRRITANT/NARCOTIC:** 8000 PPM IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.

**ACUTE EXPOSURE** - The relatively low vapor pressure and the odor and irritant properties of the vapor at low concentrations tend to limit exposure, but may not be sufficient to prevent exposure to hazardous concentrations. Exposure may cause bronchial and laryngeal irritation. Human exposure to 200 PPM resulted in respiratory changes and antipsychotic behavior. In rodents, exposure to high vapor concentrations produced dilation of the cutaneous blood vessels and central nervous system depression with dizziness, drowsiness, slight incoordination and unconsciousness. Narcosis was characterized by slow induction and long duration of effects.

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## **MATERIAL SAFETY DATA SHEET - CUMENE**

**CHRONIC EXPOSURE** - Cumene has been detected in expiratory air of human volunteers, but at a higher quantity in smokers. Hemolytic effects may be produced if Cumene is permitted to oxidize to the peroxide. Cumene appears to have a slow excretion rate and subsequent potential for accumulative effects. Repeated inhalation by rabbits and rats of 2000 PPM produced ataxia and lethargy. Rats exposed to 500 PPM/8 hours/day/6 days/week for 150 days developed hyperemia and congestion of the lungs, liver and kidneys, but no bone marrow changes.

In a recent fourteen-week vapor inhalation study sponsored by the Chemical Manufacturers' association (CMA), prolonged and repeated exposures to cumene (0, 100, 500, 1200 ppm) in laboratory rats (male and female) resulted in a dose related increase in incidence of focal nuclear cataracts and a decrease in activity (ambulatory, fine motor, and rearing) in male rats when compared to unexposed, control animals. Although these ophthalmologic changes and the neurological deficits were observed in these laboratory animals at cumene exposures above the PEL (50 ppm), the biological significance remains unclear and, hence, workers should minimize their exposures to the extent possible. CMA is sponsoring an additional testing program to assure that these observations are reproducible and are of valid concern.

**FIRST AID** - Remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial respiration. Keep person warm and at rest. Get medical attention immediately.

**SKIN CONTACT:**  
**CUMENE:**  
**IRRITANT/NARCOTIC.**

**ACUTE EXPOSURE** - Liquid contact may defat the skin and cause irritation and erythema. Undiluted liquid on rabbit skin produced moderate irritation and slight necrosis. Absorption may occur through intact skin, although large amounts are required to produce systemic intoxication. Narcosis with dizziness, drowsiness, incoordination and possible unconsciousness may result.

**CHRONIC EXPOSURE** - Prolonged exposure may cause dermatitis due to defatting and possible skin rashes.

An epidemiological study of petroleum refinery workers has reported elevations in standard mortality ratios for skin cancer along with a dose-response relationship which indicates an association between routine workplace exposure to petroleum or one of its constituents and skin cancer, particularly melanoma.

**FIRST AID** - Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention immediately.

**EYE CONTACT:**  
**CUMENE:**  
**IRRITANT.**

**ACUTE EXPOSURE** - May cause irritation, redness, pain and lacrimation. The undiluted liquid in rabbit eyes caused slight conjunctival irritation.

**CHRONIC EXPOSURE** - Repeated or prolonged contact may cause conjunctivitis.

## **MATERIAL SAFETY DATA SHEET - CUMENE**

**FIRST AID** - Wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention immediately.

**INGESTION:**

**CUMENE:**

**NARCOTIC.**

**ACUTE EXPOSURE** - May cause abdominal pain and vomiting. Necropsy of rodents revealed irritation of the stomach and intestines. If large amounts are retained, signs of central nervous system depression may occur. Aspiration may result in chemical pneumonitis with pulmonary edema and hemorrhaging.

**CHRONIC EXPOSURE** - Cumene has the potential to be passed up the food chain, but no adverse effects have been reported in humans. Rats fed 769 MG/KG daily for 194 days showed only moderate increase in kidney weights.

**FIRST AID** - Extreme care must be used to prevent aspiration. Use gastric lavage with activated charcoal and a cuffed endotracheal tube within 15 minutes. In the absence of depression or convulsions or impaired gag reflex, ipecac emesis can be done. When vomiting begins, keep head lower than hips to prevent aspiration. After vomiting stops, give 30-60 milliliters of Fleet's Phospho-Soda diluted 1:4 in water. Maintain airway, blood pressure and respiration. (Dreisbach, Handbook of Poisoning, 11th Ed.) Treatment must be administered by qualified medical personnel. Get medical attention.

**ANTIDOTE:**

No specific antidote. Treat symptomatically and supportively.

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## **REACTIVITY SECTION**

**REACTIVITY:**

Stable under normal temperatures and pressures.

**INCOMPATIBILITIES:**

**CUMENE:**

Chlorosulfonic Acid: Possible violent reaction or reaction with increase in temperature and pressure in a closed container.

Nitric Acid: Possible violent reaction.

Oleum: Possible violent reaction or reaction with increase in temperature and pressure in a closed container.

Oxidizers: Possible violent reaction.

Rubber: Some forms may be attacked.

**DECOMPOSITION:**

Thermal decomposition products may include toxic oxides of carbon.

**POLYMERIZATION:**

Hazardous polymerization has not been reported to occur under normal temperatures and pressures.



## **MATERIAL SAFETY DATA SHEET - CUMENE**

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### **STORAGE-DISPOSAL**

**STORAGE:** Protect against physical damage. Separate from oxidizing materials. Outside or detached storage is preferred. Inside storage should be in a standard flammable liquids storage room (NFPA 49, Hazardous Chemicals Data, 1975).

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### **CONDITIONS TO AVOID**

May be ignited by heat, sparks or flames. Container may explode in heat of fire. Vapor explosion and poison hazard indoors, outdoors or in sewers. Runoff to sewer may create fire or explosion hazard.

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### **SPILLS AND LEAKS**

#### **OCCUPATIONAL-SPILL**

Shut off ignition sources. Do not touch spilled material. Stop leak if you can do it without risk. Use water spray to reduce vapors. For small spills, take up with sand or other absorbent material and place into containers for later disposal. For larger spills, dike far ahead of spill for later disposal. **NO SMOKING, FLAMES OR FLARES IN HAZARD AREA!** Keep unnecessary people away; isolate hazard area and deny entry.

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### **PROTECTIVE EQUIPMENT SECTION**

#### **VENTILATION:**

Provide local exhaust or general dilution ventilation to meet published exposure limits. Ventilation equipment must be explosion-proof.

#### **RESPIRATOR:**

The specific respirator selected must be based on contamination levels found in the work place and be jointly approved by the National Institute of Occupational Safety and Health and the Mine Safety and Health Administration.

The following respirators and maximum use concentrations are recommendations by the U.S. Department of Health and Human Services, NIOSH Pocket Guide to Chemical Hazards or NIOSH Criteria Documents; or Department of Labor, 29CFR1910 Subpart Z.

- 500 PPM - Half mask chemical cartridge respirator with an organic vapor cartridge(s).
- 1000 PPM - Full face chemical cartridge respirator with an organic vapor cartridge(s).
- 1250 PPM - Any supplied-air respirator operated in continuous-flow mode.
- 2500 PPM - Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted canister.  
Supplied-air respirator with a full facepiece, helmet, or hood.  
Self-contained breathing apparatus with a full facepiece.

## **MATERIAL SAFETY DATA SHEET - CUMENE**

**8000 PPM -** Any supplied-air respirator with a full facepiece and operated in a pressure-demand or other positive pressure mode.

**ESCAPE -** Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted canister.  
Any appropriate escape-type self-contained breathing apparatus.

**For firefighting and other immediately dangerous to life or health conditions:**

Self-contained breathing apparatus with full facepiece operated in pressure demand or other positive pressure mode.

Supplied-air respirator with full facepiece and operated in pressure-demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode.

### **CLOTHING:**

Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with this substance.

### **GLOVES:**

Employee must wear appropriate protective gloves to prevent contact with this substance.

### **EYE PROTECTION:**

Employee must wear splash-proof or dust-resistant safety goggles to prevent eye contact with this substance.

**CREATION DATE:** 12/20/84.

**REVISION DATE:** 04/24/92

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